

DRAFT

**Department of Water Resources
State Water Resources Control Board
Department of Health Services**

2002 RECYCLED WATER TASK FORCE

**White Paper
of the
Public Information, Education, and Outreach Workgroup
on
Better Public Involvement
in the
Recycled Water Decision Process**

February 4, 2003

**WHITE PAPER OF THE
PUBLIC INFORMATION, EDUCATION, AND OUTREACH WORKGROUP**

INTRODUCTION

The 2002 Recycled Water Task Force was established by Assembly Bill 331 (Goldberg), passed by the California Legislature and approved by Governor Davis on October 7, 2001 (Water Code Section 13578). The Task Force is a cooperative effort of the California Department of Water Resources (DWR), the State Water Resources Control Board, and the Department of Health Services. The Task Force is charged with evaluating the current framework of State and local rules, regulations, ordinances, and permits to identify the opportunities, obstacles or disincentives to maximizing the safe use of recycled water. The recommendations of the Task Force must be reported to the Legislature by July 1, 2003.

The Task Force is composed of 40 members representing federal, state, and local governmental and private sector entities, environmental organizations, and public interest groups. To accomplish the Task Force mission, six workgroups were created to address specific issue areas. These workgroups are: CALFED/Funding; Economics; Plumbing Code Cross Connection Control; Public Information, Education and Outreach; Regulations & Permitting; and Science & Health/Indirect Potable Reuse. The workgroups contain Task Force members and other interested participants. The workgroups were intended to review all of the issues raised within their issue areas, select priority issues for in-depth analysis, and make recommendations to address the priority issues. The results of their findings were to be presented in the form of white papers to the Task Force. The white papers contain background information, analysis, and recommendations to assist the Task Force in its deliberations. Although there may be other approaches to solve California's water requirements, the Task Force was formed to address recycled water issues. Thus, the main focus is on recycled water as one solution.

While the Task Force findings will be presented in a report to the Legislature, the recommendations are not restricted to legislative actions or statutory changes. In many cases the recommendations would require actions by state or local agencies without the need for legislative authorization or mandate, and thus can be used as a toolbox for communities to use in planning a recycled water project.

The main charge of the Public Information, Education and Outreach Workgroup was to address issues related to public perception and acceptance, public education programs, and social equity in recycled water projects. In addition, the workgroup identified the entities that need to be aware of the Recycled Water Task Force and recommended ways and venues to reach such entities. Involvement at the workgroup meetings was not limited to the workgroup members, listed in Appendix A, additional interested parties and public were invited and participated in the meetings.

This workgroup began its work with consideration of a comprehensive list of issues that were proposed to the Task Force for consideration, as shown in Appendix B. DWR staff created the list through a compilation of issues found in previous work documents, solicitation from the WaterReuse Association database of interested parties, solicitation with other agencies of the public and other interested parties, and through comment solicitation at public discussion sessions. This group performed the following steps to address its charge: reflect on the issues, brainstorm good ideas, take an in-depth look at past projects, and identify public participation processes and best management practices that can be of assistance for recycled water projects throughout the state. Simultaneously, the group suggested venues where members of the Task Force could address larger audiences.

The workgroup was able to achieve its public outreach goal targeting several entities to disseminate the Task Force's mission and receiving public input to enhance the report. On May 8th, 2002, six Task Force members presented to 23 attendees of the Association of California Water Agencies Spring Conference in Monterey, California. On July 16th, 2002, prior to the 1st Public Information, Education and Outreach workgroup meeting, Task Force members presented to the San Diego Regional Chamber of Commerce Water Committee in San Diego, California. The third opportunity occurred on October 10th, 2002 at the California Water Policy Conference "POWER" breakfast in Los Angeles, California. Three Task Force members received input from the 33 members of the public attending the conference breakfast. Task Force staff took the opportunity to present to various other groups including WaterReuse Association and the environmental justice community to further advance the issues.

In California, water and wastewater agencies have implemented recycled water projects with varying levels of success, depending on the type of project and other factors. Nonpotable reuse, where recycled water is primarily used for landscape irrigation of public areas — golf courses, parks, schools, et cetera —, for agricultural irrigation, and for industrial processes, has been generally accepted by local communities and elected officials. While such projects have not been significantly impeded by any specific public policy, innovative uses for recycled water such as toilet flushing in office buildings or landscape irrigation for private homes may be dealt with differently by local health departments. The approval process necessary for such programs can be complex and seems to differ from county to county.

The hurdles faced by traditional uses of recycled water, however, pale in comparison to projects in which the eventual end use will be a source of potable (drinking) water. In general, the public's initial response to using recycled water is a visceral reaction from knowing that the source is from water mixed with human sewage (commonly referred to as the "yuck factor"). Over the past ten years, several agencies have attempted to implement recycled water projects that featured indirect potable reuse, from groundwater recharge to reservoir augmentation. In several cases, the projects were met with opposition from the public. The public opponents to these projects have included those with genuine concerns regarding the safety of indirect potable reuse.

As is evident in the large discrepancy between the number of nonpotable and indirect potable projects and in the difficulty in getting public approval for indirect potable projects, the public is more concerned with indirect potable reuse. The workgroup agrees that there are some factors associated with indirect potable reuse in California that need further investigation and clarification. For this reason, the workgroup recommends convening a panel on indirect potable reuse to study the issues of concern.

Nevertheless, it is important that a community has all the information available to make a water supply decision. With any water supply source there are no guarantees of safety, and the community should understand all of the issues behind their water options. Because indirect potable reuse has more topics to address, this white paper devotes more attention to indirect potable reuse topics. However, the basic principals presented in this white paper are valid and useful for all water recycling projects: nonpotable and indirect potable alike. The intention in this paper is not to endorse indirect potable reuse, rather to provide a framework for the local community to thoroughly investigate all options and then to make a rational decision on how to pursue their options for water supply.

The issues raised by the public were compounded by the public's general belief that the utilities were proceeding ahead on specific projects without warning or proper public input. Some agencies were taken aback by the strong public reactions, believing they had fulfilled their legal responsibilities for public notification and hearings on their projects, and that they were working for the good of the community.

In addition to public health concerns, the potential for these projects to fuel population growth has been raised. Some political campaigns have taken advantage of public concerns to promote opposition to recycled water projects as a campaign message during elections. The term "Toilet to Tap" has been very successful in gaining the attention of the public while instilling fear and a negative first impression of indirect potable reuse projects. The slogan, which gives the impression that the sewage line is connected directly to the faucet, negates the extensive treatment and safety factors incorporated into recycled water production. The slogan creates such a strong reaction that it slows down constructive dialogue on the many legitimate concerns. In some cases, agencies have abandoned controversial projects in favor of more traditional recycled water projects that are more acceptable to the public, sometimes with significantly higher production costs and lower project yields (recycled water). Within the past decade, the following indirect potable reuse projects have been affected: the San Gabriel Valley Groundwater Recharge Project, the Dublin San Ramon Services District's Clean Water Revival Project, the City of San Diego's Water Repurification Project, and the City of Los Angeles Department of Water and Power's East Valley Water Reclamation Project.

The success of all recycled water projects hinges on public acceptance. Thus, this white paper consists of chapters addressing the following: public perception issues; public engagement approaches, including a value-based decision-making process; recycled water market description, including steps to gain user acceptance, and the strategies for discussing indirect potable uses; the role of policy and politics; and summary recommendations for actions to be taken at the various government levels.

CHAPTER 1

PUBLIC PERCEPTION ISSUES

This chapter provides some background information, defines the public acceptance issues, presents four case studies of indirect potable reuse projects, and draws some conclusions from the case studies.

Description

California has been a pioneer in water recycling with over 230 hundred water recycling projects operating in the state today. Of those, four projects involve indirect potable reuse, the rest are for nonpotable purposes. This high count illustrates the public's acceptance and support for water recycling with respect to nonpotable uses. However, some major water recycling projects designed for indirect potable reuse have failed to be implemented in the past decade due to some form of public or political opposition.

At a time when water utilities should enjoy a high level of credibility with the public because they use advanced water treatment technology, the public is more aware of and concerned with water quality issues. This awareness has created an increased examination of water utilities' decisions. This scrutiny has led to the recognition that sustainable water resource management necessitates both technologically advanced facilities and state-of-the-art methodologies for public communication and participation (ref. 1).

Background

The California water supply depends on many conditions. First, the hydrology of California varies widely. Average annual precipitation ranges from 95 inches in the Sierra and Cascade Ranges, to 12 inches in the south, to less than 5 inches in the Central Valley floor. Thus, the supply varies by region north to south. The northern half receives snowmelt and runoff from the bordering mountain ranges. The southern half has to rely on imported water from the Colorado River through an aqueduct and from the Sacramento and San Joaquin rivers through the State Water Project. The demand for water varies depending on the population distribution. Also, California's population is continually growing, further stressing the state's water supplies. Finally, the water supply varies by hydrologic year classification, dry versus wet.

While during drought periods the State has suffered water shortages, even in normal rainfall years demands exceed dependable supplies. Currently in years when the rainfall level is normal to wet, the state meets its current demands through an unauthorized use of 800 thousand acre-feet per year from the Colorado River and by creating an overdraft of an additional 2 million acre-feet from groundwater. The Colorado River water will soon be appropriated and ground water stores need to be replenished, or they will dry up. California needs to maximize its water resources. One method of maximizing the existing resources, besides water conservation, is to reclaim some of the water that is discharged and eventually lost to the ocean.

With advancements in water treatment technologies, the viability of reusing water has increased. Californians have displayed a high level of acceptance to recycled water use. The recycled water is used in many ways, from irrigating school grounds and food crops, to indirect potable reuse through groundwater recharge. Intentional recycled water groundwater recharge has been successfully practiced in California since 1962: Montebello Forebay Project, Los Angeles County¹.

In spite of this wide-spread usage, there remain many factors that add to or weaken the acceptance of recycled water. The public's acceptance of recycled water varies with its use. In general, acceptance levels decrease as proximity to human contact increases. Figure 1 displays the range of general acceptance from the more acceptable on the left to the less acceptable on the right.

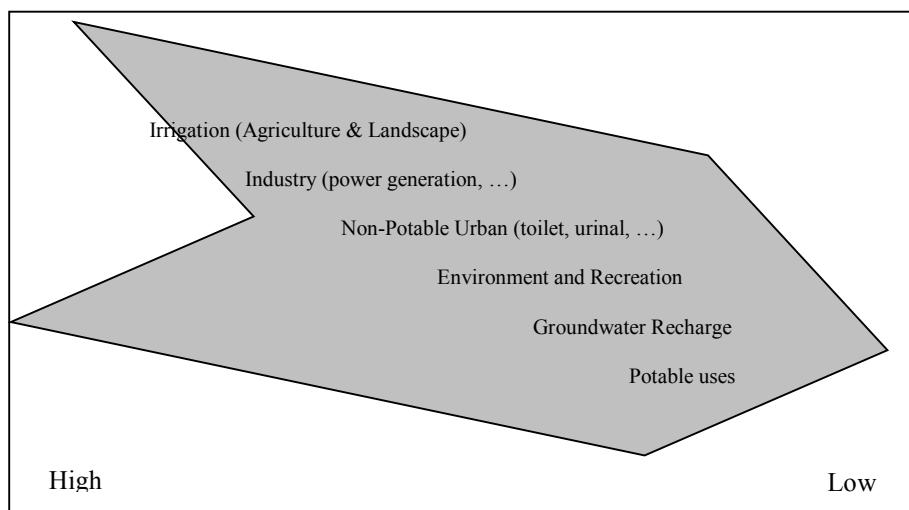


Figure 1: Level of Public Acceptance to Recycled Water Use in California

There are a variety of issues that may arise when recycled water projects are introduced: 1) water quality and public health — concern about contaminants — known or unknown — and vegetation health; 2) economics — how much will the program cost and who will pay for it, and how much will the recycled water cost the customer; 3) water supply — pertains to the growth issue where recycled water usage “frees up” potable or raw water for new development; 4) environmental justice — equity issues; and 5) general opposition — belief that recycled water should be an option of last resort. Figure 2 lists the factors that can ameliorate or intensify these concerns.

¹ The Montebello Forebay Project was implemented before state regulations were in place. Because the initial regulations did not specifically address groundwater recharge for potable aquifers, a Consulting Panel on Health Aspects of Wastewater Reclamation for Groundwater Recharge was convened which recommended a Health Effects Study on the project water to include epidemiological, toxicological, chemical, and microbiological studies. The study's results were limited by several factors: 20-year population exposure versus the standard 70-year exposure for health effects; mobility of the population; uncertain groundwater movement; and limited number of monitored contaminants. Within these confines, the Scientific Advisory Panel on Groundwater Recharge with Reclaimed Water, which reviewed the Health Effects Study, was unable to identify any health effects related to the Montebello Forebay Project.

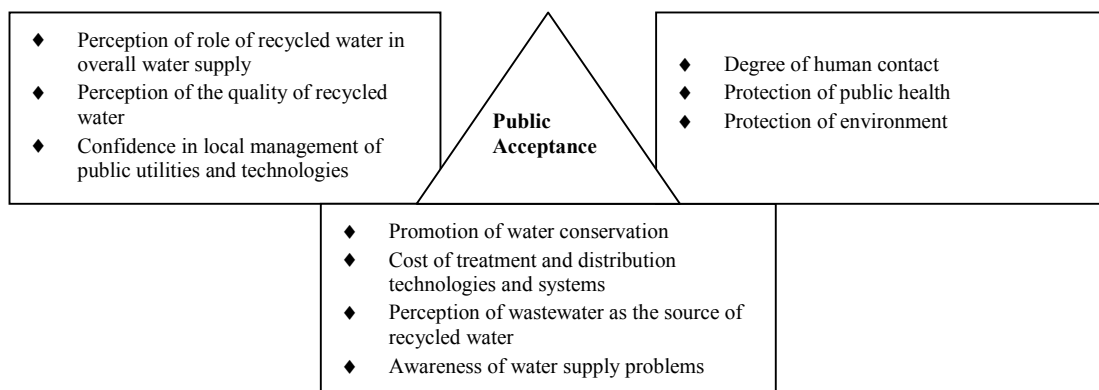


Figure 2: Public Acceptance of Recycled Water Factors (Based on Hartley....)

Water Quality and Public Health: When dealing with recycled water, public health issues continue to be the top concern. California needs additional water supplies that are safe and reliable. The standards for public health protection have been in place for many years for nonpotable recycled water. However, because of the greater potential risk and the complexity of issues to ensure public health protection, it has been more difficult to establish concrete standards and achieve public consensus for indirect potable reuse. People need to have trust in the water purification process. To engender that trust and ensure public health, on going, up to date scientific research on all our water sources, including recycled water, should be maintained.

One emerging scientific issue is the presence of endocrine disrupting compounds (EDCs) — chemicals that interfere with normal function of hormones that control growth and reproduction in animals and humans. There are other chemicals that are of concern to the public such as NDMA², a water treatment byproduct, and 1,4-Dioxane³, a by-product formed during the production of consumer products. Because of the possibility of new contaminants polluting our air, water and land, the public needs to be assured that everything is being done to protect our health. Thus, the issue of public health needs to be addressed during the community review of a project.

Economics: In general the public favors the nonpotable uses of recycled water, even when nonpotable recycled water might cost more than potable recycled water. Although there may be acceptance of recycled water use, the cost of building the infrastructure is significant. Water treatment is in general expensive. However, in order to utilize

² (NDMA: N-NitrosoDiaMethylAmine is a chemical by-product formed in acidic environments through disinfection/treatment of water, California Department of Health Services recommends consumer notification if the NDMA concentration exceeds 0.02 µg/L.)

³ 1,4-Dioxane a carcinogenic compound may be formed as a by-product of chemical reactions during the production of certain consumer products. The primary routes of potential human exposure to 1,4-dioxane are inhalation, ingestion, and dermal contact. General population exposure to 1,4-dioxane could possibly occur from contact with products containing residues formed during the manufacture of detergents, shampoos, surfactants, and certain pharmaceuticals. Residues may be present in food packaged in 1,4-dioxane-containing materials, or on food crops treated with 1,4-dioxane-containing pesticides. Consumer Product Safety Commission reported that the presence of 1,4-dioxane, even as a trace contaminant, is cause for concern.

recycled water, additional infrastructure may need to be constructed. In many cases, because the treatment that is provided for the discharge of effluent is adequate for beneficial use, the added cost for a water recycling system serving nonpotable uses is due mainly to additional storage and pipeline distribution infrastructure. Especially for indirect potable uses, there may be additional treatment and monitoring costs. Because of the possibility of increased consumers' rates, it is difficult to get decision makers to agree to implement expensive projects. However, when older facilities require increased capacity for conventional wastewater treatment discharge, costs for expanded discharge facilities can be offset by recycled water systems. This is because of the added benefit of reusing water that would have been otherwise discharged. It is impossible to make generalizations that recycled water is cheaper or more expensive than freshwater.

Water Supply and Growth: Although growth should be addressed during the community review, the issue comes up repeatedly in the discussion of recycled water projects. Recycled water augments the water supply allowing a community to grow. Therefore, recycled water, along with other additional water supplies, is considered to have growth-inducing effects, and can be used as an argument against a water recycling project. When growth is undesirable, a community can institute strong local planning controls that allow the public to have input on new developments. Then, the community can choose to specify that the "new" water would neither be for additional growth nor for the environment, but rather to preserve water reliability for the existing population. With the proper controls in place, the growth question is separated from the recycled water project question. Examples of current planning tools are the California Senate Bills 610 and 221 of 2001, "Show Me the Water" bills. These bills require detailed information regarding water availability to be provided to the city and county decision-makers prior to approval of specified large development projects.

The environmental community has expressed concern about new sources of water, including recycled water, and questioned whether this water will enable more growth, or whether additional water will benefit the aquatic environment. Recycled water produced may be targeted by the legislature to replace water that is in the environment. For example, in the Mono Lake case, the state and federal legislation contained language identifying recycled water as replacement water for Mono Lake. When specifying what use the recycled water will replace, legislative language needs to be explicit. The government subsidies provided for recycled water should accrue some measurable benefit to the environment. When the recycled water is being used to replace water already in use, and the replacement is specified, it is a way of tracking the water use. This information provides a way of addressing concerns about using the recycled water for growth and provides reassurance to the public.

California is growing regardless of the constriction of the freeways, the scarcity of the water, or the pollution in the environment. Any discussion of "new" water will naturally include a discussion of growth. Growth needs to be addressed by communities as part of an overall fresh- and wastewater management approach. This would require communities to conduct sufficient planning to address growth to maintain adequate supplies, as well as adequate sewerage system and plant capacities to prevent overflow.

Environmental Justice: This section deals with minority communities who may sense injustice in the siting of a project, or inequity in the distribution of the water product. Many people may be affected or perceived affected by recycled water projects. Also, a project may depress property values and thus seen as an economic blight. The main concern of the public and the environmental justice community in particular, is that water resource decisions are made fairly and equitably. In general, when conflicts occur, the problem is a lack of understanding and communication among all of the parties. Too often, the officials and the community believe they both know what would be best, without ever jointly identifying the problem. They have two different sets of resources and are solving two different issues. The key to resolving the conflicts is to include the public in the decision making process from the beginning. This process is described in more detail in Chapter 2.

Many indirect potable reuse water projects have been deferred or rejected by decision-makers due to active public opposition and lack of public support related to the previously discussed issues. Some of the issues encountered by indirect potable reuse projects are illustrated in the following case studies.

Case Studies

San Gabriel Valley Groundwater Recharge Project. Conceived during the 1987-92 drought, the San Gabriel Valley Groundwater Recharge Project was designed to use tertiary-treated recycled water to replenish the Main San Gabriel Basin aquifer northeast of Los Angeles. Project opponents were concerned over the recharge area's soil capacity to remove any remaining contaminants after tertiary treatment. Weeks before the project's Environmental Impact Report hearing, a citizens group took out several full-page newspaper ads declaring the indirect potable reuse project as "Toilet to Tap". In November of 1993, a local brewery, owned by a major tobacco company, then moved to challenge the project because of public health concerns. Progress ground to a halt for several years, until the project was scaled down and moved away from the brewery's wells. The project was considered unnecessary at the time, and to date, the project is still not built.

Dublin San Ramon Services District's Clean Water Revival Project. The Clean Water Revival Project had been proposed in the mid 1990s by the Dublin San Ramon Services District (DSRSD) to run recycled water through microfiltration and reverse osmosis for injection into groundwater containing high salt concentrations. The project would increase water supplies, reduce salt levels in existing groundwater, and decrease the need to export treated effluent out of Livermore Valley to San Francisco Bay through an outfall with limited capacity. Despite these projected benefits, in September of 1998, "Toilet to Tap" headlines appeared in the local newspapers and distressed citizens attended meetings at the city council and the groundwater basin manager's boardroom, influencing a political decision to not permit this project. In this case, environmental groups set up an effective campaign, which claimed that the project would induce growth and would provide water for hundreds of new tract homes. This argument strongly resonated in the affluent and slow growth community served by Dublin San Ramon District. A quite serviceable microfiltration-reverse osmosis unit now produces very high quality water for landscape irrigation.

It is important to note that a more traditional, nonpotable, recycled water project, the San Ramon Valley Recycled Water Project, was proposed in the same area and at the same time as the Clean Water Revival project, and received much less public scrutiny. The San Ramon Valley Recycled Water project is a joint project of DSRSD and the East Bay Municipal Utility District (EBMUD), and uses recycled water primarily for landscape irrigation. This project was approved unanimously and is currently in design.

City of San Diego's Water Repurification Project. The San Diego Repurification Project idea began just after the drought of 1991 and 1992. Although 1993 and 1994 were wet years, the city and San Diego County Water Authority continued to research and plan the project in anticipation of future droughts. The public outreach included almost 100 one-on-one interviews with city residents from diverse backgrounds, telephone interviews, and focus groups. Sixty percent of the telephone interview respondents favored the project when it was described. The Department of Health Services conceptually approved the project, and representatives from various groups backed the project. In 1994, an independent panel of scientists endorsed the project. A citizens advisory committee examined the project in detail and concluded it would provide a needed source of water for the region. The initial San Diego Union-Tribune editorial about the project stated the "repurified water" is safe, but questioned if the region could afford it. Further outreach work included a brochure and related fact sheets, a video describing the project, a slide presentation, a speakers bureau effort, taste tests (where according to that survey repurified water was clearly favored), over a dozen television news stories, feature stories in newspapers, and other media outlets, and a telephone information line.

In 1995, the San Diego City Council, replacing the San Diego County Water Authority (SDCWA) as the project sponsor, supported further action. The scientific review, citizens advisory group conclusion and broad support from a variety of organizations in the city provided a foundation for this action. In 1996, the responsibility for the project shifted from the City of San Diego Water Department to the City's Wastewater Department. Around this same time,

the SDCWA began to negotiate with the Imperial Irrigation District (IID) a water transfer agreement for San Diego County.

After years of research and steadily more sophisticated pilot plants, San Diego was ready to proceed with its Water Repurification Project. Secondary effluent would go through advanced treatment processes to include microfiltration, and reverse osmosis. Then, the recycled water would mix with imported fresh water in a raw water reservoir. After a year's detention, the mix would be run through a conventional water treatment plant before being distributed through the domestic water system. Despite solid support from a wide variety of community organizations, factors shifted against the Repurification Project during 1998: the water transfer supply was less controversial and less expensive, the project got caught up in the political campaigning at the federal, state and local levels, a damaging statement was included in a report released by the National Research Council (NRC), and a local science board questioned the project. The NRC report, entitled *Issues in Potable Reuse: The Viability of Augmenting Drinking Water Supplies with Reclaimed Water*, supported indirect potable reuse, provided such projects met specific conditions – which the San Diego project did. However, there was one clause included in the executive summary of the NRC report that stated "indirect potable reuse should be an option of last resort." During the 1998 campaign, the recycled water project became a political issue in the city council election, the assembly election, as well as the congressional election. The campaigns included distributing information to the public that claimed that the city proposed to take wastewater from affluent communities to distribute as drinking water to those less affluent, direct mailings to constituents sensationalizing health dangers from the project, and advertisements ridiculing project supporters on the city council.

Despite strong support from the California State Department of Health Services, a hearing was called on this project. Fully two-thirds of the meeting-notice cover page was filled with just three words: "Toilet to Tap." This resulted in hundreds of worried citizens turning out for the hearing. The County of San Diego's Science Advisory Board said the project required more study related to potential health consequences of minute quantities of a multiplicity of chemical contaminants that are not removed during the advanced treatment process. The combination of these events caused the San Diego City Council to put the project on hold in 1999. Ironically, a short time after the city council action, the San Diego County Grand Jury issued a report supporting the project. (Personal communication, Patricia Tennyson, Katz & Associates, Inc., 2002)

City of Los Angeles Department of Water and Power's East Valley Water Reclamation Project. The City of Los Angeles' Department of Water and Power embarked on its East Valley Water Reclamation Project during the 1987-92 drought. Tertiary-treated recycled water from the city's Donald C. Tillman Water Reclamation Plant would be used to replenish groundwater in San Fernando Valley. Project development entailed holding several hearings, publishing comprehensive articles in the *Los Angeles Times*, and abiding by public notification acts requirements. Shortly after construction had been completed and recycled water deliveries had begun as part of project testing, the *Daily News*, which had previously written articles supporting the project, published a "Tapping Toilet Water"

headline. The article announced that a “Toilet to Tap” project was imminent and that the public had not been informed of this project. News of this project spread to the national media and was the subject of a string of negative jokes on late-night TV talk shows. This project also attempted to start up in a mayoral election year. This resulted in candidates using recycled water as a campaign issue. Project opponents were concerned with the tertiary level of treatment, which does not remove trace organic compounds. A reverse osmosis process, which could take care of this issue, was not proposed. Nonetheless, in April of 2002, after spending approximately \$55 million on the project, Los Angeles has implemented a costly change in focus to utilize the facilities to supply recycled water for irrigation and industrial uses.

Conclusions

These case studies reveal the difficulties in implementing indirect potable recycled water projects; specifically, that the label “Toilet to Tap” cannot be avoided, that emerging unknown contaminants remain a concern, and indirect potable reuse projects are difficult to implement and can be vulnerable to political agendas.

Two major causes of difficulties in implementing these indirect potable reuse projects include insufficient public knowledge on water and wastewater issues, and decisions made to move forward with these projects without sufficient public input. Had the public been more knowledgeable on water issues and been allowed to participate in the development of these projects, it is possible that the fear and controversy generated by the “Toilet to Tap” moniker would have been greatly diminished.

The public needs information in order to be well-versed about water supply, water treatment, or wastewater issues, as well as water recycling. Water is continuously recycled, and it is very rare that end users receive “new” water. In California, the Colorado and Sacramento rivers receive hundreds of millions of gallons of secondary-treated effluent from the towns and cities in their drainage areas, along with combined sewer overflows, agricultural drainage, feedlot runoff, and contributions related to maritime traffic, human recreation, and wildlife. The discharged water may be diluted by the instream flow when present in the rivers, and natural biological processes often provide additional treatment. Still, in many cases, wastewater treatment plant effluent is treated at a conventional water treatment plant, and this water arrives at the customer’s tap much quicker than the highly treated controlled methods proposed by the indirect potable reuse projects. In spite of the unintentional reuse of wastewater, when we are intentionally reusing we should insist on the use of best available technology to treat the water. It is clear that this information needs to be disseminated to the public. With an increased awareness about where our present water supplies come from, and the treatment processes they go through, the public can participate in more constructive discussions of recycled water use. Everyone’s goal is to ensure a clean, safe, reliable water supply for their communities (ref.1). To achieve that goal, it is imperative that the public participates in the water supply decision.

One thing that all of these indirect potable reuse case studies have in common is that they were proposed as the only solution by the project proponents. The public was not invited to participate in the development of the project

through the analysis of alternatives. The absence of active stakeholder participation greatly increased the vulnerability of these projects to attack via the “Toilet to Tap” strategy. Recycled water projects should be considered as a component of a total water supply, and that multiple water sources need to be developed to ensure a safe and reliable water supply for communities. Because projects are more difficult to implement after they have been chosen and planned without sufficient public participation, the challenge is to engage the public in the process before the projects are conceived or planned. This constructive public dialogue is difficult, as the public discussion may be more contentious and additional information supplied to the public can intensify opposition and public concern (ref. 1). However, through public engagement the ultimate project should better meet the community’s needs.

CHAPTER 2

PUBLIC ENGAGEMENT

Clean, safe, and an adequate amount of water is essential to the health of California’s people, the environment, and the economy. Identifying ways to use our existing water supplies more wisely is an interest that is held strongly by the public, as well as required by law. Public participation is being examined throughout this nation. All agree that public participation is important and needs to be part of the decision making process. Within this context, recycled water can and should play an important role, but it is also within this context that advocates of recycled water must be able to clearly define and show that their product meets all interests: public health, environmental health, and economic viability, in the use proposed. One way to ensure that the product meets the needs of the public is to fully engage the public in the discussion, and incorporate their interests in the decision at the local level.

This chapter references the current public participation requirements in state and federal law, presents two personal perspectives on public outreach, details a successful water reuse project, and describes the value-based decision-making model.

Background

The law requires public participation for any new water projects. The National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) contain requirements for public participation. Most recycled water projects in the state are considered “projects” under these laws, and thus are required to comply with their public noticing provisions. (In addition to CEQA and NEPA, there are public participation requirements in other state and federal laws and regulations that may apply to water projects.) Project proponents have often believed that public participation needs are satisfied when they adhere to the CEQA and NEPA requirements; however, although the legal requirements for noticing may have been met, supplemental public outreach activities for recycled water projects are often necessary. The following paragraphs describe the CEQA and NEPA public participation requirements.

Public Notice Requirements Under CEQA: The basic goal of the California Environmental Quality Act is to develop and maintain a high-quality environment now and in the future. CEQA applies to projects, with the potential to have a physical impact on the environment, proposed to be undertaken or requiring approval by State and local government agencies. The specific goals of CEQA are for California's public agencies to: 1) identify the significant environmental effects of their actions; and, either 2) avoid those significant environmental effects, where feasible; or 3) mitigate those significant environmental effects, where feasible.

One public agency, serving as the "lead agency", must complete the environmental review process required by CEQA. The most basic steps of the environmental review process are: 1) determine if the activity is a "project" subject to CEQA; 2) determine if the "project" is exempt from CEQA; 3) perform an Initial Study to identify the environmental impacts of the project and determine whether the identified impacts are "significant".

Based on its findings of "significance", the lead agency prepares one of the following environmental review documents: a) Negative Declaration if it finds no "significant" impacts; b) Mitigated Negative Declaration if it finds "significant" impacts and, as a result, revises the project to avoid or mitigate those significant impacts; c) Environmental Impact Report (EIR) if it finds "significant" impacts. The purpose of an EIR is to provide State and local agencies and the general public with detailed information on the potentially significant environmental effects which a proposed project is likely to have and to list ways which the significant environmental effects may be minimized and indicate alternatives to the project.

A lead agency is required to consult with other public agencies involved with carrying out the project, or permitting or funding it, early in the development of a draft Environmental Impact Report (EIR). CEQA encourages, but does not include a specific requirement for, the lead agency to consult with the public during the scoping phases.

Once a draft EIR is prepared, the lead agency is then required to: post a notice of the availability of a draft EIR for at least 30 days in the office of the county clerk; mail this notice to any person who has filed a written request; send this notice to affected responsible, trustee, and federal agencies; and send the notice to any city or county which borders on a city or county within which the project is located. If state agencies are responsible agencies, copies of the EIR and the Notice of Completion must also be sent to the State Clearinghouse. The minimum review period for the draft EIR is either 30 or 45 days, if the EIR is submitted to the State Clearinghouse; the public may review and comment on the draft EIR during this time.

A Negative Declaration, or Mitigated Negative Declaration, also has a public/agency consultation process, but of shorter duration than the EIR process. The review and comment period for agencies and the public is either 20 or 30 days, depending on the type of project.

CEQA encourages, but does not require formal hearings at any stage of the environmental review process. However, many lead agencies do conduct public hearings on CEQA actions. Environmental effects may also be a subject for public comment if an agency holds a hearing (e.g. before its governing board) on a decision whether to carry out or approve a project.

Public Notice Requirements Under NEPA: National Environmental Policy Act is a national act intended to encourage productive and enjoyable harmony between humans and their environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humankind; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.

Many recycled water projects in California have received partial funding from federal agencies, most notably the U.S. Bureau of Reclamation. These projects, therefore, are subject to the National Environmental Policy Act. NEPA includes public scoping regulatory requirements, including disseminating a Notice of Intent, holding at least one public meeting, and soliciting and considering public comments. The purpose of such interactive communication is to enable both parties to learn about and better understand the views and positions of the other. Public participation provides a way to gather the most diverse collection of options, perspectives, and values from the broadest spectrum of the public, allowing agencies to make better and more informed decisions. In addition, public participation benefits stakeholders by creating an opportunity to provide comment and influence decisions.

As described NEPA and CEQA procedures are not adequate to engage the public. Public participation in CEQA generally focuses on commenting on EIR. Although encouraged, participation is only required for public agencies. In NEPA, public participation is required at one meeting, and the solicitation and consideration of public comments. Therefore a more concerted public outreach process is needed. Considering the time and cost to developing recycled water projects, there should be more opportunities for the public to participate from the formulation to the construction and implementation of the project. Early public involvement not only develops community support, it allows agencies to identify and address public concerns. This in turn assists the agency to design a project that meets the needs of the community.

Personal Studies

Certain individuals believe that their views are not considered and that they are not being consulted during the development of a water recycling project. As described in Chapter 1 Case Studies, the San Diego Repurification Project went beyond the required CEQA and NEPA public noticing requirements. In spite of this, there was still considerable public opposition. Two members of the Task Force involved in the opposition to the San Diego Repurification Project have provided their perspectives on the public outreach.

Muriel Watson of the Revolting Grandma's: Despite the public outreach performed during the development of the San Diego Repurification project, Muriel Watson and Mary Quartiano, Revolting Grandma's, write that "until around May 1997 San Diego's Toilet-to-tap was a well kept secret." They note an absence of public service announcements on both television and radio. Also, they say that newspaper stories on the project were not readily located. For this reason, Revolting Grandma's believe that the public-at-large was "left out of the information loop."

In early 1998, they became seriously active on the issue of recycled water. They shared their message at various city council meetings, garden clubs, civic-minded grass root organizations, as well as interested public. They attended the City of San Diego's Scientific Blue Ribbon Panel's public hearing and spoke at city council meetings when ever recycled water was on their agenda. The Revolting Grandma's have been in contact with members of the San Diego County Board of Supervisors. In general, they are in favor of using recycled water for non-potable uses such as highway landscaping, parks, flower field irrigation, and basic dust control. For drinking purposes, they believe that recycled water should never be used.

In spite of Revolting Grandma's outreach activities regarding recycled water, Ms. Watson and Ms. Quartiano were unaware of the 2002 Recycled Water Task Force until July 2002. Early in the morning on July 16th, 2002, the Revolting Grandma's attended the 1st meeting of the Public Information, Education, and Outreach Workgroup held in San Diego Chamber of Commerce building. Muriel Watson, representing the Revolting Grandma's, was invited to enter the meeting room early. She "walked in on what appeared to be a private meeting not intended for public consumption." (This meeting was part of the workgroup outreach where San Diego Regional Chamber of Commerce Water Committee asked Department of Water Resources staff to make a presentation on the Recycled Water Task Force activities.) No one had informed her of a prior meeting scheduled for that room, so she entered and sat down. While waiting for the workgroup meeting, she heard some of the presentation about the Recycled Water Task Force and this intrigued and troubled her.

Since that time, Ms. Watson was invited and agreed to participate on the Recycled Water Task Force as an official member and she attends various workgroup meetings. She has noted that some of the meeting times and locations have presented obstacles to her participation. For instance, the outreach for the Public Information, Education, and Outreach Workgroup on October 10th, 2002 at the California Water Policy Conference "POWER" breakfast in Los Angeles, California was difficult to attend because of the time and location. The conference coordinators gave the Task Force the 7:00 A.M. time slot. Ms. Watson chose not to utilize the lodging and travel reimbursement privileges offered to the participating Task Force members.

The Revolting Grandma's personal account illustrates some key points of public participation. Officials need to do a better job of disseminating information to the public. This can allow the public to participate in a timely manner. The Revolting Grandma's were unaware of the Repurification project until 1997. Even when they were active on the recycled water issue, they were unaware of the Recycled Water Task Force formation until eight months after

Assembly Bill 331 was signed by Governor Davis (October 2001). Additionally, as the Revolting Grandma's note with the California Water Policy Conference outreach meeting, the meeting times and locations should be chosen so that they are accessible to the widest audience to facilitate public participation.

In addition to adequate public notification and selecting appropriate meeting venues, public officials should be transparent in their actions. Public distrust of government agencies can be intensified through inadvertent actions. This is illustrated in the Revolting Grandma's perception about the outreach meeting in San Diego. Ms. Watson was unapprised about the purpose of the earlier meeting, and it continues to agitate her. Officials need to be aware of how an act or activity can be misinterpreted by the public. Therefore it is important for public officials to be cognizant of the public around them and to promptly explain their activities to the public.

Herman Collins of Collins Strategic Group, Inc.: The co-chair of the Public Information, Education, and Outreach Workgroup to the 2002 Recycled Water Task Force, Herman Collins, was introduced to recycled water through the San Diego Repurification Project. He states that he and the environmental justice community in San Diego were steered by a politician to believe that 70% of the project water would be delivered to the low- and moderate-income communities. Since that time, he has learned otherwise. Herman Collins, correcting the misperception that he and others held about the San Diego Repurification Project, said that the mixture of treated and untreated water in San Vicente Reservoir would have been delivered to 80% of the affluent urban communities including Point Loma, Scripps Ranch, San Carlos, and other neighborhoods down the pipeline from the reservoir. Lake Skinner's treated water would have been used in the northern part of San Diego County. The bottom line is that the water was not being delivered only to low- and moderate-income neighborhoods. The existing infrastructure determined where the water would flow, and it included all income types.

Mr. Collins said that although he was a leader of an opposition group in the past, he could be a strong advocate for the utilization of recycled water and recycled water projects for certain activities and uses. He stresses the importance of the public's voice in the issues surrounding recycled water. If the public does not take part in the decision, we cannot ask them to take part in the solution. Mr. Collins states that education is a must and was a factor in turning his view around to accept some forms of recycled water usage. He emphasizes the need to work with the challenges presented by the opposition. By understanding the opposition's issues, we can arrive at common goals to further the use of recycled water.

Mr. Collins' account illustrates several key points of public participation. Government and elected officials often try to gain only their proponent's support because they do not want to waste their time or insight with their presumed opposition who may not support them. Opponents should not be ignored, for they may provide valuable insight and become a supporter. For example, Herman Collins now views recycled water projects differently because he has been involved in the process.

Education is an important aspect to public acceptance. Education on recycled water aided Mr. Collins to accept some uses of recycled water. Also, for a successful project, the public needs to participate in the decision to choose the water resource alternative. For the public, when we hear that certain communities are being affected more than others, we should take a deeper look at the facts. Information and education can facilitate this process.

The following case study describes one project that has provided a good example of public outreach.

Case Study

Orange County Water District and Orange County Sanitation District Groundwater Replenishment System: The Orange County Water District (OCWD) and Orange County Sanitation District (OCSD) Groundwater Replenishment System (GWR System) began through an internal evaluation when considering a replacement for Water Factory 21 (in operation for more than 25 years and always meeting drinking water standards in purifying sewer water for a seawater barrier). The evaluation consisted of looking at several alternatives, including seawater desalination.

The GWR System was selected based on several factors. The project provides reliable, drought-proof water to an area with reoccurring droughts. The project cost is comparable to infrastructure improvements that would be necessary for other alternatives. The GWR System will replace Water Factory 21 with a new high-tech membrane purification system to expand the seawater barrier and recharge the groundwater basin. The actual cost to Orange County consumers is minimal, less than two postage stamps per month on their water bill. The project also provides needed water diversity and reuses a valuable resource. OCWD and the community believe that it is irresponsible to import water to southern California and use it once and dump it into the ocean.

Thus, this project solves four community problems: minimizes future water shortages, lowers the mineral content of the groundwater basin, prevents seawater intrusion, and delays and may eliminate the need for another ocean outfall.

After conventional secondary wastewater treatment, the water is further treated by microfiltration, reverse osmosis, and ultraviolet light in combination with hydrogen peroxide disinfection to produce near-distilled water quality. Minerals are added to the “purified” water (as occurs during bottled water production) to allow transport through cement lined pipes to the recharge area. There the water is discharged and allowed to percolate into the underground aquifers.

Although the GWR System was initially a “decide, announce, defend” project, OCWD began its outreach efforts in December 1997. The first few years, OCWD convened focus groups and conducted surveys. Initially, the outreach efforts concentrated on briefing the top county leaders, businesses and the media. Then OCWD expanded to include political, environmental, and community groups in the outreach efforts. OCWD performed the public outreach efforts required by the National Environmental Policy Act (NEPA) of 1969 and the California Environmental

Quality Act (CEQA), but received little or no attendance. Realizing that the required efforts were ineffective, OCWD began a proactive effort to bring the information regarding the recycled water project to different groups.

OCWD has developed the appropriate tools to address their community in several ways. The outreach efforts include brochures, videos, feedback cards, bookmarks, a web page linked to OCWD and OCSD, press releases, tours of full scale GWR System development facilities, and samples of microfiltration and reverse osmosis membranes to bring to every talk so people can touch and feel them. OCWD has information packets available along with specialized "white papers" on key issues. OCWD keeps interested people up to date on the GWR System through an e-mail distribution list. OCWD also facilitates staff education through paid lectures by outreach experts.

To help with state and federal political outreach, OCWD documents its supporters through a computerized support list, which is provided to legislators and staff. OCWD recently hired an agency political outreach expert to help with this project and OCWD's legislative outreach, to improve and solidify political support for GWR System.

OCWD applied several important ideas gleaned from the surveys of its community. The project outreach must address health and safety concerns. Because the public believes health and medical experts, OCWD utilizes credible testimonials of experts on water recycling projects from in and outside the county. When presenting to key audiences — women, mothers and seniors — face to face presentations provide the most credibility. OCWD avoids jargon in these presentations, because it generates mistrust.

OCWD listened to its constituents and applied their suggestions to gain their approval. For instance, the early research found that reverse osmosis elicits public trust. Therefore, the project board leadership made the decision to treat the water with 100% microfiltration, reverse osmosis and ultraviolet disinfection with hydrogen peroxide (H_2O_2) in order to produce the highest quality water possible. The research also determined the preferred term to use for the recycled water, "purified".

When OCWD approaches an organization, individual or business for support, a computer program established by OCWD has the ability to provide all related existing letters of support from related groups, political leaders and community organizations in the geographic area.

Humans, with the aid of computers, have continuously monitored the water purification system's water quality for over 7 years. Also, an outside study conducted by experts chosen by user cities found the water to be safer than any other source water available. The testing has shown that no contaminants made it through the multiple-barrier process. There are multiple safeguards in the plant and distribution system and through half the water being filtered the natural way, through ground percolation.

Value-Based Decision-Making Model

While the requirements for consultation, review and notice under both CEQA and NEPA are a critical part of the public involvement process, the personal accounts show that even with additional outreach many citizens are not in the water resource information loop. Therefore a more comprehensive public outreach approach is necessary for recycled water projects.

Public participation and representation is founded on the idea that those who are affected by decisions or policies initiated by the relevant bodies should participate or be represented in the policy making processes. With the need to supply additional water in the state and the potential use of recycled water projects to meet that need, water utilities and the decision-makers need to make an investment in the public arena, so that their decisions will pay off in the long run for their customers and their communities. One of the methods available for public participation is the value-based decision-making model.

The points described in these personal studies are all part of the value-based decision-making model. The central tenet of the value-based decision-making model is that the public is capable of making wise and prudent decisions. It is essential to have substantive public involvement throughout the planning, deliberation, decision, design, and implementation processes. This entails notifying and consulting with the public at all stages of the environmental review process even though such involvement is not required.

Early public involvement, before development of the CEQA and/or NEPA document, can assist the project proponent in identifying and responding to the concerns of the public. Public participation creates empowerment and empowerment yields a sense of collaboration. The more comprehensive the level of participation, or the more inclusive the level of representation, the less likely that those subject to a resulting policy will consider that policy unfair or illegitimate. One method of engaging or representing the public is through value-based decision-making. This process consists of making decisions based on what individuals and society want.

After a thorough understanding of the community's requirements and desires, a communication or "marketing" plan is created to promote the decisions. Although the public often perceives this type of marketing as a way to manipulate them, many outreach professionals believe that marketing strategies compliment the participation methods. Marketing is described as 1) identifying what the public values, 2) developing and presenting of a range of options designed to meet those interests, 3) determining and selecting a product or item that addresses those values, and *then* 3) crafting a communication strategy that emphasizes the values and product's relationship to the public value. In fact, employing highly participatory methods, like value-based decision-making, to ascertain and recognize what the public values and assess how recycled water might address those values, is a prerequisite to crafting effective communication strategies (ref. 1).

The full range of interested and affected parties should be included in project planning and development. Notices and other outreach materials should be available in the languages spoken and be placed in familiar community venues (e.g. civic organizations, churches) and distributed at local stores in the project area. Community leaders should be involved to identify appropriate venues, and meetings should be held at times and locations that are convenient for the communities affected by the project.

A key element of value-based decision-making is to identify common values and interests, and to include a full range of options. When making decisions a precautionary approach should be used — “Go slow before you know”. Public participants need to have access to resources (scientists, technical assistance and time) to participate fully, thus creating transparency in the evaluation process and decision making. The project’s technical analysis (science, economics, and environmental and social impacts) should be robust. Finally, the project must be responsive to the public process and community feedback in the final project design.

Conclusion

State and Federal legislation requires that the public be permitted to provide input on certain projects with the goal to facilitate both parties to communicate, learn, and understand the others views and positions on the project. Both NEPA and CEQA encourage additional public participation. Even when further outreach is performed, as in the San Diego, there may still be problems encountered that may affect the outcome of a project. However, using a value-based decision-making model improves the collection of options, perspectives, and values on a water resource project from a diverse section of the public. The knowledge gained provides agencies with the tools to make better and more informed decisions.

CHAPTER 3

RECYCLED WATER MARKET

This chapter defines the recycled water users’ acceptance issues, provides some background information, presents case studies of recycled water projects that have been implemented, and draws some conclusions from these case studies.

Description

In the consideration for the planning of a recycled water project, the market plays a major role. Mills and Asano (ref. 2) describe the specifics of the recycled water market. They state that public and user acceptance, along with factors of public and environmental health, and water quality complicates the selection and sales of recycled water. To identify and secure a market for recycled water takes additional communication, education and outreach to address the concerns of the actual recycled water users.

Background

The need for additional sources of water in a community is usually determined through local, regional, and state planning processes: Urban Water Management Plan, water facilities master plan, the general plan or other planning documents. Since regions are unique, regional planners need to appraise their water assets and all existing and potential water supply options. In fact, the California Urban Water Management Planning Act (California Water Code Division 6) stipulates that each urban water supplier, providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare, update and adopt its urban water management plan at least once every five years. An urban water management plan assists a water agency to evaluate the water supply picture for the community and prepare for future water requirements. The planning document should include information on water supply, water demand, supply reliability, supply and demand comparison, water shortage contingency plan, conservation measures, as well as wastewater and recycling. Since the California Urban Water Management Planning Act requires that recycled water be integrated into the document as a planned source of water, planners can look at local supply and evaluate how recycled water can play into the local supply. For instance, planners and their constituents can discuss the region's self-sufficiency in terms of water during droughts and may consider recycled water as a water source.

Although the California Urban Water Management Planning Act requires an examination of the larger water utilities, there are other optional plans that some communities elect to perform, such as water facilities master plan, the general plan, or other planning documents. When a water provider analyzes the water supply through the planning processes, the benefits of recycled water may provide a solution for their system. Usually recycled water benefits are depicted in one of two ways: new water supply, or discharge reductions. The potential benefit will determine which plans will highlight the recycled water benefits. The plans may be developed in coordination with other plans for the community through the regional master plans for water and wastewater. These planning documents are typically created through a public process, thus approved as part of a larger strategy. This is a good way to get the public involved early, well in advance of any specific recycled water project.

With other water supplies there has been little need to incorporate the public into the decisions during the early stages. However, as described in Chapter 1 Case Studies, when recycled water is proposed the public needs to be informed and take part in the decision making process. Yet, public participation is not an intuitive process. The public participation literature lacks information pertaining to a practical approach for a planning department of a public utility. A model is needed to assist the planning department implement a recycling water project. The model could come from the perspective of planners, using their specific experiences and core themes. For instance, the model could be organized by various responsible agencies: 1.) Recycled water project procedures, 2.) Utility company procedures, and 3.) Local land use/planning agency procedures. The two types of recycled water projects could further categorize these groupings: 1.) Recycled water as a stand alone project, 2.) Recycled water as a component of another project. Regardless of how the model is constructed, it needs to assist a planning department

to address the public when deliberating a recycling water project. Key stakeholders should be integrated in the strategic or long-term planning process.

The responsibility to listen and communicate effectively with the public and allow them to participate in the recycled water decision is paramount. Participation can cultivate a diverse, active, and vocal outside constituency for the project. Literature on public participation contains recurring key themes: honesty, trust, knowing the target audience, saying things in the correct sequence, and including the right people: those with concerns, and those implementing the project. By creating a sharing dialogue with the public, listening as much as talking, the utility can learn about a community's concerns and issues. In that way, they will be better able to come up with a set of choices with facts, procedures, and techniques to address those barriers. Utilities need to realize that different groups are at various levels of the learning, need, and anxiety curves and that each community works within their own time frame.

The utility should take the time and inform the public, not sell the public, on recycled water. For instance, if a community is considering recycled water, provide questions to ask and procedures or steps to take. Basically, provide guidelines on what generally works. One tool to present the water options is to prepare a side-by-side comparison of the various water supplies: desalination, recycled, Sacramento River, et cetera, along with the relative risks of the various sources. Also, the utility should try to answer the question of what source provides the safest and most reliable product. The utility should be honest where more study of the various treatment methods results may be needed. For instance, determine how much NDMA remains after reverse osmosis.

By informing the public, they are empowered to make an informed choice for their situation. When developing a recycled water project, many agencies utilize, what has been termed, the "Decide-Announce-Defend" strategy. This technique involves selecting or appearing to select the best project alternative before completing the supporting studies and/or consulting with key stakeholders. This significantly increases the chances that those stakeholders will stop the project. Instead of the "Decide-Announce-Defend" strategy, agencies need to present all the water source options available to a community along with the pros and cons of the various options. This information levels the playing field for all options. Finally, officials need to consider and to incorporate the public's ideas into the project plan.

Political campaigns and "Toilet to Tap" grab the public's attention. One method to catch the public's interest could be to describe what benefits people receive in exchange for the recycled water use. Utilities can explain these benefits to the end user, consumer, through a simple note, a mailing, or utility bill insert that describes the derived benefits in their local community as a result of recycled water usage. For instance, a resident of a community may be interested in information on economic benefits of recycled water. This information could be presented in a chart that correlates number of household members versus indoor water usage, outdoor water usage and cost savings using

recycled water for irrigation. Utilities can simply state that conservation will benefit, or more specifically highlight how recycled water benefits the environment, for instance, stream bed augmentation.

Mills and Asano (ref. 2) state that the three phases to planning a recycled water project are: conceptual, feasibility, and facilities planning. After the conceptual phase where recycled water appears to be a possible alternative for some of the project objectives, the feasibility phase of planning begins. To ensure social feasibility, the public should be involved with the choice and selection of a recycled water project. However, recycled water customers play a major role in the feasibility of a water project. The customers determine whether the project is feasible: technically, economically, financially, and institutionally.

Both the water utility and the potential customers have certain requirements for the water transaction to take place. The water utility agency has to determine the following: potential users along with their location and usage type, public health requirements including treatment level for uses and application requirements, water quality regulatory requirements, water quality needs for the usage, and current and projected water cost and quality. The potential recycled water customers are identified and consulted to determine whether they are willing and able to use recycled water. Some of the factors to determine the viability for recycled water user's needs include: location of user in relation to the project, water quality needs, water pressure requirements, reliability of water quality and quantity, disposal issues for unused water, plumbing infrastructure cost and funding, cost of the recycled water in comparison to current and other future potential sources, and when they are prepared to use recycled water.

In researching a potential customer's requirements, a utility can better determine whether recycled water will be a preferred option. For instance, one recycled water benefit is its reliability in times of critical dry periods. Certain business users have switched to recycled water because of its reliability. For instance, Topan, a company based in San Diego, makes computer chips using recycled water because its reliability and their need for high water quality. Therefore, recycled water could provide job security for certain industries. If a community has parks and golf courses, recycled water help the vegetation to remain green during water shortages. That is a real benefit to the community.

In furthering the market assessment, the recycled water purveyors need to inform the customers of any applicable regulatory restrictions, probable quality, reliability, and cost. In addition to this information, customers may express concerns related to the ability to prevent worker contact, possible union objections, costs versus additional inconvenience of using recycled water, conversion costs, and liability.

The following case studies describe two recycled water projects and how they addressed some of these issues.

Case Studies

Serrano Development: Northern California's Serrano Recycled Water project located in El Dorado Hills, El Dorado County, is a recent endeavor which uses recycled water as the main water supply for irrigation. The original purpose at Serrano, a master-planned golf course community in the Sierra foothills, was to use recycled water to irrigate common area landscapes such as golf courses, greenbelts, parks, and playing fields. These common areas were brought on line with recycled water in 1996. Since 1999, a total of 1500 residential lots have been developed with the recycled water infrastructure in place.

In 1990, the developers, Serrano Associates LLC, initiated the project when they approached the El Dorado Irrigation District with its plan to incorporate recycled water capability into the community's infrastructure. Serrano developers proposed to fund and to construct tertiary treatment and pumping facilities at the El Dorado Irrigation District's Deer Creek Wastewater Treatment Plant. The developers also included a distribution system to deliver recycled water from the district's Deer Creek Wastewater Treatment Plant.

Although the end users, the homeowners, reap the benefits of the recycled water to irrigate their private yards, they lack the choice to use another source of water except to refrain from purchasing a home in the project area.

Nonetheless, Serrano performs outreach and education for their homeowners so that homeowners can safely use and enjoy the benefits of the recycled water. First, all home owners receive and sign for the "Recycled Water Users Manual for Dual Plumbed Homes in Serrano" and "Serrano Custom Lot – Recycled Water Irrigation Design Guidelines" to learn how to correctly and safely install the irrigation system. Serrano El Dorado Owners' Association requires the submittal and approval of architectural plans to alter homeowner's landscape, including pools and front- and backyards. The Association also orients contractors on the recycled water use in Serrano and maintains a list of these of "Authorized Contractors" to be employed by the owners when performing irrigation system work. To distinguish the recycled water from drinking water, the Health and Safety Code mandates the use of purple pipes, which can be purchased in certain home improvement stores. After installing irrigation systems, an inspector checks the construction and performs a cross connection test to ensure the drinking and recycled water systems are not connected.

Homeowners participate in this project fully informed. When they choose to buy a home in this area, the homeowner is given all the necessary information and support to conform with the recycled water regulations.

Work with the Serrano Development displays that when using recycled water for landscape irrigation a progressive approach works. The project begins with irrigating medians and golf courses, then progresses to irrigating playgrounds and back yards.

Monterey County Water Recycling Projects: The Monterey County Water Recycling Projects (MCWRP) was designed to reduce seawater intrusion along the northwest portion of Monterey County by using recycled water instead of ground water. It began operation in 1998 following almost 20 years of planning. Since then, over 14 billion gallons of recycled water have been produced for irrigation of high quality food crops, such as artichokes, lettuce, cauliflower, celery, and strawberries for national and international distribution.

The project's success is based on many years of careful planning, plus an emphasis on customer service. Early on, it was determined through discussions with local growers that produce safety and marketability would be key issues that must be studied. Consequently, a special five-year field test was conducted in the early 1980's that demonstrated that produce irrigated with recycled water was safe for human consumption. And, an extensive marketability study confirmed that the produce could be successfully distributed and that labeling was not needed since the irrigation water met state standards.

However, local project acceptance was also very important. Support was obtained from those in the agricultural industry by including their input in the produce safety field test study, and by obtaining their understanding that recycled water was the least expensive potential new water source. The environmental community also supported the project since supporting agriculture adjacent to the local communities meant that the land would be less likely to be urbanized. They also liked the idea that wastewater discharges into the Monterey Bay Sanctuary would be reduced.

Two years before project start-up, concerned growers and the utility formed a grower committee to provide input on project design and operation. The county acted on their concerns, and initiated a supplemental food safety study that focused on potential pathogens in the irrigation water. The county also developed a media emergency communications plan. This grower committee continues to meet monthly, thereby assuring that grower concerns are promptly addressed. Plant operating safety is documented directly with the growers, as well as on the MRWPCA web site.

Local urban support for this project has been strong based on an aggressive community education program. These efforts consist of a school classroom presentation program, frequent treatment plant tours, project exhibits at local community events, presentations to service clubs, and quarterly billing inserts to all wastewater customers outlining the success of the project.

Public acceptance of recycled water for agriculture is never a sure thing. It requires constant education and acknowledgement. Overall, the keys to their project success stem from the ongoing dialogue with local recycled water customers, plus persistence in accomplishing their mission.

Techniques for a utility to enhance public participation and help with the recycled water decision.

Continual dissemination of accurate and complete information on water issues to the public is essential, using mechanisms such as utility bill inserts, regular public workshops or community meetings, or any other methods that may be available to the local agency. This information should include discussion of issues related to water supply, pollution prevention, water and wastewater treatment, and recycled water, and the interrelation of these elements as part of the water cycle. Regular tours of water and wastewater facilities can be offered to the public to provide first hand familiarity and understanding of water related issues.

All feasible uses of recycled water should be considered in the development of alternatives, and all potential nonpotable and indirect potable uses should be analyzed. Nonpotable uses receive relatively high acceptance from the public. However, for nonpotable uses to be cost effective, the infrastructure, dual plumbing, needs to be in place. The appropriate time to integrate water recycling into the infrastructure is at the beginning when open land is being developed. That way the cost-effectiveness is the greatest. Retrofitting new pipes is time-consuming and expensive. As a potable source, recycled water is perceived as undesirable. In order to make an equitable decision on the water source, information on all the alternatives should be prepared to present to the public. The necessary homework should include a very clear project description, i.e. what are the project's objectives, what are the drivers, why does the project need to be implemented at this time and in this place. Develop the project as part of an integrated resource management program so that it isn't a choice between different projects but that each project is essential in the larger resource plan. Identify and build community consensus on the interests to be served and explore all of the possible options.

As has been stated frequently in this report, the education has to be ongoing, this includes education for politicians and media. This is important because projects can take decades, and the people consulted in the beginning during project planning may no longer be around by the time a project is ready for implementation. Regular briefings ensure that the public, media, politicians, and project supporters are informed and the current questions are addressed. A well-informed public and a broad base of community supporters can reduce the effect of opposition caused by media and political misinformation.

Any water project in California has the potential to be controversial. Therefore, it is important for project sponsors to be prepared with all the information necessary to demonstrate the need for the recycled water project and address potential issues that might be raised by the public. Also, there should be transparency in the project's design and goals. The project should fit into a larger plan that ideally the community has already accepted. This is where it is important to coordinate activities between land use planning, water supply planning, and wastewater treatment and discharge needs. This ties the recycled water project into existing plans adopted through a public process. Additionally, project sponsors need to clearly demonstrate the "water shortage" to prove that the water is for present day water supply deficit and future demand need, not for new sprawl.

Project sponsors should develop and foster good relationships with elected officials who will be voting on the project, including those who are not public advocates for the project. Recycled water project planners can take opportunities to recognize the elected officials when possible, support their efforts when appropriate, and build mutually beneficial relationships. These relationships can help with project approval and funding.

The project should have a well-respected/well-spoken representative as agency spokesperson, as well as a good and diverse support base that is educated and can be articulate champions. The agency needs to ensure that project supporters are well equipped to address the public, address the public's concerns, and present support for the project through a well founded and documented deliberation process. Prepare your spokespeople through reliable information and education. Make sure that they have the information and tools to properly make the case for the project. Public facilitation training can prepare your community representatives with tools to work with the diverse stakeholders. These project proponents should attend public meetings to make the base of community support visible and to provide a source of advocacy outside of the project-sponsoring agency.

For success, a project needs to gain support from local community leaders: safety experts, scientists, elected officials. The opinions have to be culturally relevant to the community – someone the community can identify with and someone with a good understanding of the community's particular concerns: safety, health, et cetera. A community is more inclined to believe the opinions of local experts rather than bringing in experts from Europe or someplace afar. An expert with scientific credibility from within a community can provide a valuable perspective that is respected by the community. The city councilperson, the county supervisor, and any other influential community leaders from the project area need to be vocal supporters of the project. Also there is a need for recycled water project planners to communicate with these leaders to educate them so that they can ably advocate for the project. The communication should occur with them early and often during the planning process, to establish a long-term relationship of support for the project.

Strategies for Public Engagement on Indirect Potable Reuse

Direct and indirect potable reuse can be a controversial issue. There are localities that believe that potable reuse is the most viable option for meeting their long term water supply needs. The decision to pursue potable reuse must be done within a framework of public participation. This paper does not specifically address direct potable reuse. Currently, there are no health standards in place and there have been no proposals for direct potable reuse in California. However, communities considering direct potable supplies can and should employ the same tools used for all water sources. In that way, a community planning to use recycled water for drinking purposes can be prepared with the appropriate questions.

As was noted in Chapter 1, indirect potable reuse has the least public acceptance and has experienced the most difficulties in implementation. While it may be economically feasible to have an indirect potable reuse project, it is

for a community to decide how to deal with their water issues. This section addresses some special considerations when planning an indirect potable reuse project.

General Strategies for Informing the Public of the Facts of Indirect Potable Reuse

Providing Information on a Regular Basis: We often perceive that pure water occurs naturally from rain, snow-covered mountains, and/or underground springs. In reality, water in the environment has varying levels of contamination from naturally occurring sources (arsenic, radionuclides, manganese, wildlife, et cetera) and human-made sources. “Pure” water is a human-made product as a result of taking water from the environment, and running it through various treatment processes to make it “pure”, i.e. potable. Although the truth about the purity of water may be distasteful, the public requires this information on the various sources of water, the influence of natural and human-made contamination of the sources, and the availability of technology and associated costs needed to treat water to various levels of purity. The public should also be provided with accurate information on water supply issues beginning with the sources of the supply, present and future demands on various supplies, and water quality issues and water rights. This information will allow the public to recognize important issues related to water supply and water quality, which can go hand-in-hand with the development of objectives related to water supply reliability and water quality. This information should be given without the identification of specific projects in mind. Furthermore, this information should be regularly updated and presented so that the public becomes and remains adequately informed on water issues. By providing a continuous stream of accurate information, the public should begin to appreciate what a valuable resource water is, and how water quality can be affected in the many ways that water may be recycled through the water cycle. Most contaminant sources occur from human activities, municipal, industrial, and agricultural pollutants, and other sources occur naturally in the environment.

Active Public Participation: Regardless of how the information is provided to the public, the public’s input on project planning and selection is necessary. This participation may employ a stakeholder process to achieve consensus on water supply and quality objectives and possible methods to achieve them. After consensus is reached on what the issues are, the public can be provided with information on technologies (such as water treatment options) and practices (such as conservation) that can be used for development of a complete palette of possible alternatives for achieving water quality and supply objectives.

Each alternative should be studied sufficiently to determine positive and negative aspects of each, including an analysis of relative risk. Indirect potable options must be discussed and compared with other options, such as seawater desalination and dual plumbing, and the relative risks and costs associated with identified options must be included. During discussions of potential health concerns or unknowns associated with indirect potable reuse, health concerns and unknowns associated with other sources of supply must be included with the reminder that most natural sources of water are not “pure”. Specific examples of where various potential technologies have been implemented elsewhere should be provided including data on how well they perform. Providing tours of water

supply and treatment facilities can be very effective at this point, and will provide participants with a first hand view of these processes in action.

Water transfers, seawater desalination and construction of dual distribution systems for delivery of recycled water for nonpotable uses are typical options that surface when indirect potable reuse is being considered. Sufficient information on these and other alternatives should be available to the public including the extent of infrastructure, relative risks, costs, energy needs, and potential environmental impacts so that meaningful fact-based dialogue on these and other possible alternatives can occur. Fact-based dialogue with the public may reveal that one of these alternatives may in fact be the best alternative for the community, or may build public confidence for indirect potable reuse as the best alternative. For example, in the case of newer communities, a dual piping option where recycled water distribution pipelines can be installed during development may prove to be the best option for utilizing recycled water, while older large established cities would have a much more difficult task in implementing a dual piping option. To illustrate this point, there are over 7000 miles of potable water distribution pipelines (along with all of the associated tanks, pumps, and reservoirs) in the City of Los Angeles, often located within streets already jammed with other substructures, and installation of a substantial dual piping option may prove infeasible. By providing the public with accurate information on all possible alternatives to meet water supply and quality objectives, informed decision-making could take place on selection of solutions that may actually be supported by the public.

Statewide Panel Addressing Indirect Potable Reuse Issues: The current scientific studies, by following all the treatment procedures on the books, demonstrate that recycled water is safe when used for the intended purposes. However, when dealing with indirect potable reuse projects additional work needs to be addressed. The state should convene an advisory panel to advise how to approach the public, inform them of the scientific information to advance the safe use of recycled water.

Conclusions

Before proceeding with a water recycling project, all water resource alternatives need to be evaluated, using consistent criteria. Californians need to use all good water resource management tools to cope with future demands: conservation, recycling, and land use planning in addition to other water supply alternatives. Because water conservation measures are often the most cost-effective means stretching the water supply, the cost-effective measures should be implemented before attempting to implement water recycling. Water resource project alternatives should be evaluated based on assessment of all health, costs, environmental, and relative risk factors. When provided with all the current information, the public can make an educated choice. This level playing field may result in the public selecting recycled water to meet their needs.

Continual dissemination of accurate and complete information on water issues to the public is essential, using mechanisms such as utility bill inserts, regular public workshops or community meetings, or any other methods that may be available to the local agency.

CHAPTER 4

POLICY AND POLITICS

Description

All recycled water projects — both nonpotable and potable — involve public relations challenges. Nonpotable uses (landscape irrigation, industrial uses and toilet flushing in commercial buildings) are considered the more “traditional” uses for recycled water. Because such projects have been successfully operating in California for the past century, they are generally easier to implement through the public approval process. Regardless of how traditional the project is, however, ongoing public outreach is still necessary, especially among those who will come in contact with the recycled water (landscapers, building maintenance staff, etc.).

Indirect potable reuse projects, those which treat effluent to a high level (tertiary treatment for recharge on the surface, or advanced membrane processes for injection below ground) to supplement a groundwater aquifer or a raw water reservoir for ultimate use as drinking water, have had much greater challenges. While there is no specific public policy that prohibits indirect potable reuse, local politics have stalled numerous projects. Projects that have been implemented have experienced significant cost increases and schedule delays due to the need to address external factors such as appropriate uses for recycled water and development impacts, as well as public relations challenges.

Background

Policy Relations: The following provides a description of examples of local and state public policies and legislative impediments that exist for potable and nonpotable recycling projects.

State support for water recycling is not well known, even though the legislature has been clear in its support for water recycling. As early as the 1970s the Legislature enacted the Water Reuse Law of 1974 (Water Code section 460) with the stated mission that “the primary interest of the people of the state in the conservation of all available water resources requires the maximum reuse of reclaimed water in the satisfaction of requirements for beneficial uses of water”. Furthermore, state law declares that use of recycled water by communities will contribute to the peace, health, safety, and welfare of the people of the state (Water Code section 13511).

More recently in 2000, the State Legislature enacted Water Recycling in Landscaping Act (SB 2095, Johnston) which requires dual plumbing for recycled water in new subdivisions under certain situations. This act promotes the use of recycled water for landscaped areas by directing local agencies to adopt a recycled water ordinance, as specified. Despite this legislation, it can still be very difficult to get local health department approval for a landscape irrigation project at residences where the individual homeowner has control of the irrigation system as opposed to a

system that is maintained by a homeowner association. A local water agency that proposes the first such program in their county will often find the approval process long and tedious.

A recent survey of city and county planning agencies revealed that approximately 41.8% of the 173 agencies, which responded, are using recycled water. Clearly, the local agencies are struggling to adopt and implement this new requirement. However, health and regulatory agencies at the local level seem to lack a common mission when it comes to recycled water. Some local health offices are not familiar with recycled water applications, guidelines, rules and regulations. Because of this, some local county health authorities tend to apply more stringent requirements than stipulated in the statewide uniform recycling criteria that the Legislature has delegated to the California Department of Health Services. These variations cause confusion, uncertainty, and unnecessarily raise the unit cost of production and distribution of recycled water.

The State needs to communicate its mission of encouraging recycled water use as stated in the Water Code throughout all government levels, to facilitate projects, and to communicate the rules clearly to local health offices. Additionally, the State could take the lead in ensuring that local offices are consistent in their application of state policy. The State could be helpful by providing informational materials and education to the local agencies on the legislated recycled water regulations. The various Regional Water Quality Control Boards need to understand the correct regulations and to remove unnecessary impediments from water recycling permits.

In addition to State responsibilities, local governments need to have strong local ordinances that are enforced. Many local jurisdictions' governing bodies have approved ordinances (usually during a drought) which require dual plumbing where recycled water is available. However, local regulatory agencies (building inspectors, code enforcement officers) are not requiring dual plumbing in many new developments. Many planning and/or public works departments do not have the staff or resources available to audit effective implementation of these ordinances. If a jurisdiction has locally adopted the statewide water code requiring dual plumbing for recycled water, they must be effectively enforced by all the regulatory agencies.

There is a perception that the government is asking communities to do more with recycled water than is done within public agencies. To encourage recycled water use public agencies should take a leadership role by using recycled water in public agency buildings to flush toilets, and/or to irrigate city parks.

Another potential policy hurdle is the lack of unified definitions when discussing recycled water and the various treatment levels available. Most nonpotable recycled water uses speak of tertiary-treated (Title 22) water. When the discussion switches to potable reuse projects, it is still referred to as "recycled water" even though such projects generally go far beyond Title 22 to include microfiltration, reverse osmosis, ultraviolet disinfection, ozonation, et cetera.

There are also mixed messages about recycled water quality due to the prevalent signage. For years the public has read signs which has given the message not to drink recycled water. Now the public is being told that recycled water is safe to drink. Also, the public questions why additional treatments are applied if the water is safe. (The water is injected into aquifers or retained in holding ponds for a specified period of time before distribution to the public.) The public needs to understand the reasons for the additional treatment and delivery delay. A statewide system of codification that refers to the various treatment levels beyond Title 22 would help to develop a common language that is more easily understood during public discussions of proposed projects. This new language can be appropriately applied to the signs to clear up the mixed messages. When it comes to recycled water, one description or name does not fit all.

Political Relations: There are political forces that confront every project to some degree. As noted in Chapter 1 Case Studies, politicians in San Diego and Los Angeles used recycled water projects for their own campaigns. In San Diego, during the 1998 campaign, the recycled water project became a political issue in the city council election, the assembly election, as well as the congressional election. As stated in the Personal Studies section of Chapter 2, Herman Collins and the environmental justice community in San Diego were steered by a politician to believe that 70% of the water would be delivered to the low- and moderate-income communities. Even though Mr. Collins has now learned otherwise, that erroneous belief still exists. The campaigns included distributing information to the public that claimed that the city proposed to take wastewater from affluent communities to distribute as drinking water to those less affluent, direct mailings to constituents sensationalizing health dangers from the project, and advertisements ridiculing project supporters on the city council.

The Los Angeles project also had the misfortune of attempting to start up in a mayoral election year, resulting in candidates jumping on the anti-reuse bandwagon. Mayoral candidates used the recycled water project to fuel the conflict between the San Fernando Valley and the rest of Los Angeles. The recycled water was to recharge the aquifer in San Fernando Valley. Inequity perceptions were created with people in the San Fernando Valley questioning why they were to receive the recycled water. In actuality, the waters in those aquifers serve the communities of Hollywood, Los Angeles and others, not the San Fernando Valley.

As can be seen, the political scene is unpredictable. The election cycle and vocal opposition groups can inhibit political support for recycled water projects. In order for politicians to support a project, they need to know the facts about a project, as well as be assured that the project has voter approval. Meeting with policy makers on a regular basis can help to inform politicians of the status of the project, as is done in Orange County. However, to meet with policy makers on a regular basis may be challenging. Alternatively, communities and project proponents could take the approach used by the Sacramento Water Forum Agreement⁴. Unlike the “decide, announce, defend” method the

⁴ The Sacramento Water Forum Agreement was signed in April 2000 by 40 Sacramento region water purveyors, public officials, community group leaders, environmentalists, and business representatives capped six years of analysis, discussions and negotiations. The design of negotiated settlement considered two objectives: provide a reliable water supply for Sacramento; *and* preserve the environment of the Lower American River. The Water

stakeholder group united together, approached the politicians, and informed them of their project plans. This group had a sufficiently broad and diverse membership who understood and supported the agreement, and the politicians did not want to oppose them.

As described, the development of a stakeholder process that includes representation from as many groups and interests as possible is highly advisable to assist with identification of key issues, objectives, and potential solutions for meeting those objectives before any specific solution or project is decided upon. Ideally, the stakeholder group should reflect the values of the community and identify the best alternative to meet the objectives within the context of those values. Even though an alternative selected in this manner may not be the most economical or desirable alternative from an engineering standpoint, it is the alternative most likely to bring success as it can most likely be implemented with the benefit of public support instead of opposition. A stakeholders process will not only increase the chances of success in developing and implementing projects, but also will further enhance the process of informing the community as stakeholders share information with their constituents. Most importantly, a stakeholder process will help build trust between local agencies and the communities that they serve, which is essential to the success of potentially controversial projects. The chairmanship of the stakeholder group could have continuous rotation to cultivate non-partisan qualities.

In addition to a stakeholder group, an independent advisory committee could be convened to review the proposed project in the context of other water resource planning decisions. To engender the validity of the committee, the review bodies should be composed of experts in the field from a variety of viewpoints who are “above the fray” without a vested interest.

Media Relations: The media plays an important role in the broadcasting of information to the public as is described in the Chapter 1 Case Studies. Although the case studies described situations where the media has damaged water resource projects, the media can help inform the public about activities in their community. By assisting utilities to spread the word about potential projects, the media informs the public of the opportunity, as well as responsibility, to speak up on important issues. In order for the media to inform the public, they need to be provided with accurate information.

The protocol for recycled water education is to provide the necessary tools and the background to understand all water projects, not to sell or persuade the public to use recycled water. The tools provided, appropriate questions to ask of all water projects, should level the playing field for all water sources: groundwater, surface water, desalination, and reclamation. The tools should include the advantages and disadvantages of each source in terms of planning, reliability, environmental impacts, and safety, because risk exists in every single source of water, even

Education Foundation’s publication, *The Water Forum Agreement: A Model for Collaborative Problem Solving*, summarizes and explains the process used to reach this multi-stakeholder, multi-interest agreement. A copy of the publication can be obtained by contacting the Water Education Foundation, Sacramento California.

mountain spring water composed of glacial melt. The tools should include questions about safety features incorporated into recycled water projects.

This can be accomplished with media kits, fact sheets, etc. It may also be helpful to prepare question and answer/fact sheets and press releases to address every issue raised. Additionally, articles and opinion pieces can be submitted to local media for publication. An Internet site, or library service, devoted to water issues, which explains what water solutions appear to be appropriate under what conditions, and with what caveats, could aid in the decision. Because misinformation may be circulated, it is extremely important to provide responses and rebuttals to anything that is incorrect. The public will remember the last thing said; if it is inaccurate information, the information needs to be corrected with the right information. While cultivating the media, utilities should provide information about the project to editors, those responsible for the headlines.

As with the anti-smoking campaign that includes radio and television advertisements reaching a large audience, a similar program could be developed to provide information on water issues on a large scale. The State could also work with organizations such as the Water Education Foundation, which have already produced videos on water issues, including recycled water, and fund updates and expanded programming. Cable television networks could then be encouraged to broadcast these videos regularly throughout the state. An advertising agency/public relations firm could be retained to assist the State in the development of short messages with specific information on urgent topics such as drought, conservation, pollution prevention, water quality, stormwater, wastewater, or recycled water including indirect potable reuse.

These elements could be discussed in a water cycle context to increase public awareness of the “big” water picture. For example, a message to conserve water could also include a reminder that water is precious and must be taken care of since it is recycled through the water cycle over and over again. By presenting water issues in the context of the water cycle, the public will become aware of the realities of water supply, including the fact that all water is recycled, and that there is considerable wastewater effluent in our present water supplies, and zero discharge of pollutants is the goal of the Clean Water Act. In addition, water quality topics regarding newly discovered contaminants or concerns could be presented in a water cycle format to help describe relative risk in the context of all water supplies rather than concentrating on a specific supply such as recycled water. Until the public is consciously aware of these facts, discussions on recycling water for indirect potable reuse will remain very difficult. Sponsorship of such an effort on a state level is prudent given the importance of water issues and the obvious low level of public awareness of these issues.

Water Industry Coordination. Water industry officials need to be on the same page with recycled water so that they can provide guidance. To facilitate this, a coalition of water agencies and organizations, such as the Water Education Foundation, American Water Works Association, California Urban Water Agencies, California Urban Water

Conservation Council, WaterReuse Association, and the Association of California Water Agencies, should be formed to develop a consistent position on water recycling and so the water industry can take a leadership role.

In addition, existing and new water recycling informational programs developed at various agencies could be coordinated and publicized throughout the industry. The audience for education could be both water supply officials as well as the general public. Many agencies have developed programs that could be part of a “do-it-yourself” kit that all water agencies could use to prepare them for communicating with their communities and local media. This Coalition could also prepare opinion-editorial (op-ed) pieces for publication in newspapers throughout the state.

The current signage for recycled water sends mixed messages. DHS and industry should get together and set a standard signage for regulatory use, which also aids the public’s understanding of recycled water.

Education Programs: People need to have information on the complete water cycle starting with kindergarten up to the university level. The public has a misperception that water is pure, and recycled water is a fall from grace. School programs can teach how all water is recycled. In addition to advanced treatment with multiple barriers, recycled water projects have time as a safety feature, water stored from 6 months to 5 years before distribution, but stream flow, which contains recycled water, is distributed in a rapid time scale.

While individual water agencies can make strides in introducing students to recycled water and other water resources issues during their existing classroom education programs, true change will not take place until recognition of these water issues is made at the level of the State Board of Education. The Board issues “content standards” for each grade, K-12, in each subject area such as science, math, history-social science and English-language arts. Because schools are now graded on how their students perform on the standardized state tests, principals and teachers are reluctant to allow classroom time for “extra” programs such as water education unless a clear connection can be made to the content standards for their grade level. In other words, if it is not on the test, most teachers do not have the time or incentive to teach it. Most local water agencies with education programs are aware of the increased emphasis being placed on testing and the curriculum content standards and have made efforts to align their programs to the standards. While concepts such as the water cycle are included in the science content standards, recycled water is never mentioned specifically in any of the science standards nor in the history-social science standards. The State needs to encourage the school districts to implement programs, and to provide educators necessary materials and support for successful programs about water. Having the importance of water recycling added to the state standards would dramatically improve their inclusion in local classrooms. (Note: complete curriculum content standards are available on line at www.cde.ca.gov/standards/.)

Although water resource issues and very basic water cycle information is presently being taught in public schools, there is considerable room for improvement. Ideally, water resources and the water cycle should be discussed in each grade with greater detail and complexity in higher grade levels with a very strong and detailed program for middle school and high school students. It is critical that public education includes a complete discussion of the

water cycle including the waste elements such as wastewater treatment plant discharges and their influence on surface and groundwater supplies. Water education should also include field trips to water treatment and water recycling facilities, so that students can learn about these processes first hand. Field and lab work could provide hands-on experience with many water cycle elements. The Department of Water Resources could team up with educators to develop comprehensive water education curricula. Such an enhanced public education program will ensure that future generations will be aware that there is no “new” water and that all water is recycled. This enhanced program would also insure that future generations are keenly aware of natural and man-made processes that occur between the toilet and the tap.

Conclusions

One of the stated purposes of AB 331, which created the 2002 Recycled Water Task Force, is to “advise the Department of Water Resources in investigating the opportunities for using recycled water in industrial and commercial applications and in identifying impediments and constraints to increasing the industrial and commercial use of recycled water.” The State needs to work more closely with local agencies to provide current and cost effective technical assistance, greater education and clarification on recycled water use policy.

Several key ideas have been expressed in this chapter. The State should form a coalition of water agencies and organizations, to develop a consistent position on recycled water. Then, the State should convey its mission with regard to maximizing recycled water use throughout all government levels, and facilitate projects and communicate the rules clearly to local health offices. To encourage recycled water use, the State could use recycled water in public agency buildings to flush toilets, and/or to irrigate city parks.

State should develop an easily understood common language of referring to the various recycled water treatment levels beyond Title 22 to improve public discussions of proposed projects. DHS and industry should also set a standard signage for regulatory use, which also increases the public’s understanding of recycled water.

Next, the State should work more closely with local agencies to provide current and cost effective technical assistance, greater education and clarification on recycled water use policy. This could be accomplished by providing informational materials and education to the local agencies on the legislated recycled water regulations. Existing and new recycled water informational programs developed by various agencies could be coordinated and publicized by the State for use throughout the industry. State ensures that local offices are consistent in their application of state policy. Regional Water Quality Control Boards should familiarize themselves with the correct regulations so that the necessary safety factors are maintained and unwarranted impediments are removed from water recycling permits.

State Department of Water Resources should work with educators in developing a comprehensive water education curriculum which specifically includes recycled water in the Content Standards for California Public Schools: science standards and/or the history-social science standards.

Local governments should create well-defined local recycled water ordinances. If the statewide water code requiring dual plumbing where recycled water is available has been locally adopted, they must be effectively enforced by all the regulatory agencies (building inspectors, code enforcement officers). To effectively audit the implementation and enforcement of these ordinances, local governments should obtain adequate staff or resources for planning and/or public works departments.

Local agencies considering recycled water project implementation can do several things to aid public participation. Local agencies should form a stakeholder group, which includes public participants with representation from many groups and interests, to identify key issues, objectives, and potential solutions for meeting those objectives. Local agencies should meet with policy makers on a regular basis to inform politicians of the project status.

Local agencies should also be prepared to answer questions and utilize the opportunities presented by the media. To cultivate the media relationship, local agencies should inform editors, those responsible for the headlines, along with other media personnel (reporters, anchors, etc) about recycled water and the project through media kits, fact sheets, etc... Preparing question and answer/fact sheets and press releases to address every issue raised, and submitting articles and opinion pieces to local media for publication is another way for local agencies to utilize the media. Local agencies should also provide timely responses and rebuttals to any misinformation.

SUMMARY RECOMMENDATIONS

This workgroup began its work with consideration of a comprehensive list of issues that were proposed to the Task Force for consideration, as shown in Appendix B. DWR staff created the list through a compilation of issues found in previous work documents, solicitation from the WaterReuse Association database of interested parties, solicitation with other agencies of the public and other interested parties, and through comment solicitation of at public discussion sessions. This group performed the following steps to address its charge: reflect on the issues, brainstorm good ideas, take an in-depth look at past projects, and identify public participation processes and best management practices that can be of assistance for recycled water projects throughout the state. Simultaneously, the group suggested venues where members of the Task Force could address a larger audience.

The following list of recommendations was developed from a consideration of a comprehensive list of issues that were proposed to the Task Force Appendix B. This list was then subdivided and applied to one of the six workgroups for further study. After this Public Information, Education, and Outreach workgroup reflected on the issues, brainstormed good ideas, took an in-depth look at past projects, and identified public participation processes and best management practices, they chose these recommendations to be presented to the Task Force to be the most beneficial for the State in addressing the issue of public participation in the recycled water decision-making.

I. Engage the public in an active dialogue using a value-based decision-making model in planning water recycling projects.

1. Increase public participation through vigorous outreach, augmenting the notification requirements stipulated by CEQA and NEPA.
2. Make project decisions that respect and incorporate the community's values and concerns (considering growth, coordination with local planning, environmental justice issues, et cetera).
 - i. Develop the project considering values and ameliorating the concerns gathered at public forums.
 - ii. Recruit consumers for a stakeholder group to assist in the review of the project, alternatives considered, and selection.
 - iii. Meet with policy makers in the early stages and on a regular basis to obtain support to ameliorate challenges that could affect the project.
3. Hold more public meetings to gather and supply information at appropriate venues.
4. Convene an independent advisory committee composed of experts in the field and consumers from a variety of viewpoints who have no vested interest to review the proposed project alternatives, its implementation and operation where needed.
5. Educate and consider with the public all the alternatives for locally achieving water supply goals.
 - i. Evaluate all water resource alternatives using consistent criteria before proceeding with a water recycling project as part of an integrated water resources approach.
 - ii. Evaluate water resource project alternatives based on assessment of all health, costs, environmental, social and relative risk factors, and degree of multiple benefits.
 - iii. Provide on-going updates with all the current information, work progress, and decisions to the community to facilitate an educated choice.
6. Local Agencies cultivate and utilize the media opportunities for their projects:
 - i. Inform media personnel (editors, reporters, anchors, etc) about recycled water and the project through media kits, fact sheets, et cetera. Note that many agencies have developed programs that could be part of a "do-it-yourself" kit that all water agencies could use to prepare them for communicating with their communities, local media, and local schools,
 - ii. Prepare question and answer/fact sheets and press releases to address every issue raised,
 - iii. Submit articles and opinion pieces to local media for publication,
 - iv. Provide timely responses and rebuttals to any misinformation,
 - v. Continually disseminate accurate and complete information on water issues to the public utilizing:
 - utility bill inserts,
 - regular public workshops,
 - community meetings.

II. "Top Down" Support for Water Recycling

State Support

1. Take a leadership role on water recycling:
 - i. Develop an easily understood common language of referring to the various recycled water treatment levels beyond Title 22 to improve public discussions of proposed projects,
 - ii. Develop a consistent position on water recycling. A coalition of water agencies and organizations, such as the Water Education Foundation, American Water Works Association, California Urban Water Agencies, California Urban Water Conservation Council, WaterReuse Association, and the Association of California Water Agencies, could be formed to help develop the water recycling position.
 - iii. Appoint person to provide information to legislators on water issues to foster champions in the political arena to speak on water issues with the public.
 - iv. Convey its mission to maximize recycled water use throughout all government levels via interagency collaboration,
 - v. Set a standard signage for regulatory use which increases the public's understanding of recycled water,
 - vi. Facilitate projects and communicate the rules clearly to local health offices,
 - vii. Encourage recycled water use by using recycled water in public agency buildings to flush toilets, and/or to irrigate city parks.
2. Convene a statewide panel to address issues related to indirect potable reuse.
3. Provide funding for public education and outreach
4. Coordinate and publicize existing and new water recycling informational programs throughout the industry
5. Work closely with local agencies on water recycling to include:
 - i. Provide technical assistance on current and cost effective technology, greater education and clarification on recycled water use policy through informational materials and education supplied to the local agencies on the legislated recycled water regulations
 - ii. Coordinate and publicize existing and new recycled water informational programs developed by various agencies for use throughout the industry.

Local Government Support

1. Create well-defined local recycled water ordinances.
2. Effectively audit the implementation and enforcement of these ordinances, through adequate staff or resources for planning and/or public works departments.

Regulatory Agencies Support

1. Building inspectors, code enforcement officers, etc.; effectively enforce local recycled water ordinances.

III. Convene a Statewide panel to recommend changes to public schools and higher education curricula

1. Develop comprehensive water education curricula for each grade (K-12) which incorporates recycled water in the Content Standards for California Public Schools: science standards and/or the history-social science standards.
2. Approach institutions of higher education to incorporate recycled water education into their curricula.

3. Enhance existing programs, for example those offered through the Water Education Foundation, or other organizations.

It is recommended that by 2007 the State Board of Education add to the Science and/or Social Science Content Standards at appropriate grade levels recognition of the following concepts:

- ❖ Water is a finite resource. There is no such thing as “new” water.
- ❖ The population of California is constantly growing. However, the supply of water remains the same, or in some cases less than in previous years (i.e. less water will be available to California from the Colorado River in the future.)
- ❖ Conservation of water and other natural resources is critical.
- ❖ The basic water cycle is already covered sufficiently in the existing content standards. However, at the Grade 5 level and above, the water cycle should be discussed in each grade with greater detail and complexity in higher grade levels with a more sophisticated explanation that includes wastewater (sewage) treatment discharges and their influence on surface and groundwater supplies as part of the cycle. This enhanced program would also insure that future generations are keenly aware of natural and man-made processes that occur between the toilet and the tap.
- ❖ Water education should also include field trips to water treatment and water recycling facilities, so students can learn about these processes first hand. Field and lab work could provide hands-on experience with many water cycle elements.
- ❖ Discuss the complete water cycle including the waste elements such as wastewater treatment plant discharges and their influence on surface and groundwater supplies.
- ❖ Water recycling is an important component in conservation efforts in California.
- ❖ Water recycling mimics the way nature cleans water (sedimentation, aeration and filtration). However, water recycling plants can clean larger quantities of water more quickly than nature.
- ❖ Describe the various recycled water uses in California.
- ❖ The Department of Water Resources could team up with educators to develop comprehensive water education curricula.
- ❖ The Department of Water Resources could help to enhance existing programs, for example those offered through the Water Education Foundation, or science fair projects. The education can also include a coloring book on recycled water

IV. State-sponsored media campaign:

1. Develop a water issues information program for radio, television, and print.
2. Work with organizations that have produced videos on water issues, including recycled water, and fund updates and expanded programming, and encourage cable television networks to broadcast these videos regularly throughout the state.
3. Prepare opinion editorial pieces for publication in newspapers throughout the state

4. Retain an advertising agency/public relations firm to assist in the development of short messages with specific information on urgent topics such as drought, conservation, pollution prevention, water quality, stormwater, wastewater, or recycled water including indirect potable reuse. (Emphasis should be inclusive of the locales' diversity)

REFERENCES

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Appendix A

LIST OF MEMBERS OF THE
PUBLIC INFORMATION, EDUCATION AND OUTREACH WORKGROUP

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Appendix B

LIST OF ISSUES PROPOSED FOR CONSIDERATION RELATED TO PUBLIC INFORMATION, EDUCATION, AND OUTREACH ISSUES

1. Determine current public perceptions and acceptance of water recycling
2. Provide a consistently high funding for public education programs
3. Additional testing and certification to ensure the safe use of recycled water
4. Update epidemiological studies and provide an overall current assessment of the science regarding public health and the use of recycled water
5. Address social equity in the distribution of recycled water
6. Educate farmers and growers who are often reluctant to use recycled water as allowed in state health regulations
7. Provide grants for education of the public / farmers / food processors
8. Review best management practices (BMP) for recycled water outreach efforts
9. Consider demographic issues and audience analysis for outreach efforts.